

Appl. No. 10/036,466  
Amdt. Dated August 7, 2006  
Reply to Office Action of May 19, 2006

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended) An apparatus comprising:

a cache of a current peer in a current ring at a current level to store information of ring peers within the current ring, the current ring being part of an hierarchical ring structure of peer-to-peer (P2P) nodes, the hierarchical ring structure having at least one of a lower level and a upper level; and

a peer locator coupled to the cache to locate a target peer in the cache in response to a request to search for the target peer.

2. (currently amended) The apparatus of claim 1, further comprising:

a peer interface coupled to the peer locator to interface to at least one of a first lower peer in a first lower ring at the lower level and a first upper peer in a first upper ring at the upper level, the peer interface to forward the request to search for the target peer to at least one of the first lower peer and the first upper peer when the target peer is not located in the cache.

3. (currently amended) The apparatus of claim 2, wherein the peer interface comprises:

a lower interface to interface to at least one of the first lower peer and a second lower peer in a second lower ring at the lower level, the lower interface to forward the request to at least one of the first and second lower peers to search for the target peer when the target peer is not located in the cache.

4. (currently amended) The apparatus of claim 3, wherein the lower interface to receive the request from at least one of the first and second lower peers to search for the target peer.

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5. (currently amended) The apparatus of claim 2, wherein the peer interface comprises:

an upper interface to interface to at least one of the first upper peer and a second upper peer in a second upper ring at the upper level, the upper interface to forward the request to at least one of the first and second upper peers to search for the target peer when the target peer is not located in the cache.

6. (currently amended) The apparatus of claim 5, wherein the upper interface to receive the request from at least one of the first and second upper peers to search for the target peer.

7. (original) The apparatus of claim 2, wherein the cache stores information of at least one of the first and second lower peers.

8. (original) The apparatus of claim 2, further comprising:

a registrar to process registration of at least one of the current peer to the first upper peer and the first lower peer to the current peer, the registration including the information on one of the current peer, the first upper peer, and the first lower peer.

9. (original) The apparatus of claim 1, wherein the peer locator comprises:

an information retriever to retrieve the information of the target peer if the target peer is located in the cache.

10. (original) The apparatus of claim 1, wherein the information includes an address of the target peer.

11. (currently amended) A method comprising:

storing information of ring peers within a current ring at a current level in a cache of a current peer in the current ring, the current ring being part of an hierarchical ring structure of peer-to-peer (P2P) nodes, the hierarchical ring structure having at least one of a lower level and an upper level; and

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locating a target peer in the cache in response to a request to search for the target peer.

12. (currently amended) The method of claim 11, further comprising:  
interfacing to at least one of a first lower peer in a first lower ring at the lower level and a  
first upper peer in a first upper ring at the upper level; and

forwarding the request to search for the target peer to at least one of the first lower peer  
and the first upper peer when the target peer is not located in the cache.

13. (currently amended) The method of claim 12, wherein the interfacing comprises:  
interfacing to at least one of the first lower peer and a second lower peer in a second  
lower ring at the first lower level; and  
forwarding the request to at least one of the first and second lower peers to search for the  
target peer when the target peer is not located in the cache.

14. (currently amended) The method of claim 13, wherein interfacing to at least one  
of the first lower peer and a second lower peer comprises:  
receiving the request from at least one of the first and second lower peers to search for  
the target peer.

15. (currently amended) The method of claim 12, wherein interfacing comprises:  
interfacing to at least one of the first upper peer and a second upper peer in a second  
upper ring at the upper level; and  
forwarding the request to at least one of the first and second upper peers to search for the  
target peer when the target peer is not located in the cache.

16. (currently amended) The method of claim 15, wherein interfacing to at least one  
of the first upper peer and a second upper peer comprises:  
receiving the request from at least one of the first and second upper peers to search for  
the target peer.

17. (original) The method of claim 12, wherein storing the information comprises:

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storing the information of at least one of the first and second lower peers.

18. (original) The method of claim 12, further comprising:  
processing registration of at least one of the current peer to the first upper peer and the  
first lower peer to the current peer, the registration including the information on one of the  
current peer, the first upper peer, and the first lower peer.

19. (original) The method of claim 11, wherein locating comprises:  
retrieving the information of the target peer if the target peer is located in the cache.

20. (original) The method of claim 11, wherein storing the information comprises:  
storing an address of the target peer.

21. (currently amended) A system comprising:  
a requesting peer to generate a request to search for a target peer; and  
a current peer in a current ring at a current level, the current ring being connected to the  
requesting peer in an hierarchical ring structure of peer-to-peer (P2P) nodes, the hierarchical ring  
structure having at least one of a lower level and a upper level, the current peer including a P2P  
subsystem, the P2P subsystem comprising:  
a cache to store information of ring peers within the current ring, and  
a peer locator coupled to the cache to locate the target peer in the cache in  
response to the request.

22. (currently amended) The system of claim 21, wherein the P2P subsystem further  
comprising:  
a peer interface coupled to the peer locator to interface to at least one of a first lower peer  
in a first lower ring at the lower level and a first upper peer in a first upper ring at the upper  
level, the peer interface to forward the request to search for the target peer to at least one of the  
first lower peer and the first upper peer when the target peer is not located in the cache.

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23. (currently amended) The system of claim 22, wherein the pccr interface comprises:

a lower interface to interface to at least one of the first lower peer and a second lower peer in a second lower ring at the lower level, the lower interface to forward the request to at least one of the first and second lower peers to search for the target peer when the target peer is not located in the cache.

24. (currently amended) The system of claim 23, wherein the lower interface to receive the request from at least one of the first and second lower peers to search for the target peer.

25. (currently amended) The system of claim 22, wherein the peer interface comprises:

an upper interface to interface to at least one of the first upper peer and a second peer in a second upper ring at the upper level, the upper interface to forward the request to at least one of the first and second upper peers to search for the target peer when the target peer is not located in the cache.

26. (currently amended) The system of claim 25, wherein the upper interface to receive the request from at least one of the first and second upper peers to search for the target peer.

27. (original) The system of claim 22, wherein the cache stores information of at least one of the first and second lower peers.

28. (original) The system of claim 22, wherein the P2P subsystem further comprising:

a registrar to process registration of at least one of the current peer to the first upper peer and the first lower peer to the current peer, the registration including the information on one of the current peer, the first upper pccr, and the first lower pccr.

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29. (original) The system of claim 21, wherein the peer locator comprises:  
an information retriever to retrieve the information of the target peer if the target peer is  
located in the cache.

30. (original) The system of claim 21, wherein the information includes an address of  
the target peer.